

REMARKS

Reconsideration of the application in view of the above amendments and the following remarks is requested. Claims 14-20 and 23-35 are in this application. Claim 14 has been amended. Claims 1-13 and 21-22 have been cancelled. Claims 23-35 have been added to alternately and additionally claim the present invention.

Applicant requests the Examiner to indicate whether the replacement sheets filed on June 6, 2005 with the last amendment have been entered into the application. Applicant notes that in the next communication following receipt of the drawings, applicant is to be notified by the Examiner if the drawings have been entered and, if not entered, applicant should receive an explanation as to why the drawings were not entered. (See MPEP §608.02(h).)

The Examiner rejected claims 14, 17, and 19-20 under 35 U.S.C. §102(b) as being anticipated by Yang (U.S. Patent No. 6,232,215 B1). The Examiner also rejected claims 18 and 21-22 under 35 U.S.C. §103(a) as being unpatentable over Yang. For the reasons set forth below, applicant respectfully traverses these rejections.

Claim 14 has been amended and recites, in part:

“forming a layer of conductive material on a conductive region and a layer of insulation material;

“etching the layer of conductive material to form a trace, the trace having a first length, a first width, a first height, a top surface and a bottom surface;

“etching the trace to form a slot opening in the top surface of the trace, the slot opening having a bottom surface spaced apart from the bottom surface of the trace, a second length, a second width, and a second height, the first and second lengths being substantially equal.”

In rejecting the claims, the Examiner pointed to the formation of conductive layer 48 on insulation layer 44 shown in FIG. 4 of Yang as constituting the forming a layer of conductive material element of claim 14, and the etching of conductive layer

48 shown in FIG. 5 of Yang as constituting the etching to form a trace element of claim 14.

As shown in FIG. 5 of Yang, little or no overetching is performed during the etch, which can produce a metal region with no stringers (e.g., the structure on the left side of FIG. 5), but can also leave stringers 54 when the underlying surface is uneven (e.g., the structure on the right side of FIG. 5). (See also column 5, lines 8-14 of Yang.)

The Examiner next argued that Yang teaches the required "etching the trace to form a slot opening" element of claim 14. However, from what applicant can determine, the next etching step taught by Yang is illustrated in FIG. 7 where the metal regions, once protected by side wall structures 56, are further etched to remove the stringers 54.

As a result, although Yang teaches further etching the metal region on the right side of FIG. 7, there is nothing in Yang that teaches or suggests that this additional etching forms an opening that has a bottom surface which is spaced apart from the bottom surface of the trace as required by claim 14. Instead, Yang teaches that this additional etching is specifically intended to remove the stringers 54.

Thus, since the Yang reference fails to teach or suggest the "etching the trace to form a slot opening" element, claim 14 is not anticipated by the Yang reference. In addition, since claims 17-20 depend either directly or indirectly from claim 14, claims 17-20 are not anticipated by the Yang reference for the same reasons as claim 14. (Claims 21-22 were cancelled.)

The Examiner also rejected claims 14 and 20-22 under 35 U.S.C. §103(a) as being unpatentable over Knight (U.S. Patent No. 4,541,893). For the reasons set forth below, applicant respectfully traverses this rejection.

In rejecting the claims, the Examiner pointed to the formation of conductive layer 22 on insulation layer 21 shown in FIG. 5 of Knight as constituting the forming a layer of conductive material element of claim 14, and the etching of conductive

layer 22 described in the text of Knight as constituting the etching to form a trace element of claim 14.

The Examiner appears point to the etch of conductive layer 22 that forms pedestals 24 as shown in FIG. 6 of the Knight reference as constituting the required "etching the trace to form a slot opening" element of claim 14. In addition, the Examiner appears to point to the opening that lies between the left and right pedestals 24 shown in FIG. 6 of Knight as constituting the slot opening required by claim 14.

The formation of pedestals 24, however, can not be read to be the formation of the slot opening required by claim 14 because the length of conductive region 22 is not substantially equal to the length of the opening between the left and right pedestals 24. As shown in FIG. 6 of Knight, the length of conductive region 22 (read to be the trace required by claim 14) is substantially longer than the length of the opening between the left and right pedestals 24 (read to be the slot opening required by claim 14). As a result, it is not possible for the length of conductive region 22 to be substantially equal to the length of the opening between the left and right pedestals 24 as required by claim 14.

Thus, since the Knight reference fails to teach or suggest that the lengths of the trace and the slot opening are substantially equal, claim 14 is patentable over Knight. In addition, since claim 20 depends from claim 14, claim 20 is patentable over Knight for the same reasons as claim 14. (Claims 21-22 were cancelled.)

The Examiner further rejected claims 15-16 under 35 U.S.C. §103(a) as being unpatentable over Knight or Yang, as applied above, in view of Krishnan (U.S. Patent No. 5,998,299). However, as noted above, claim 14 is patentable over Knight and Yang. Since claims 15-16 depend either directly or indirectly from claim 14, claims 15-16 are patentable over Knight or Yang in view of Krishnan for the same reasons that claim 14 is patentable over Knight or Yang.

New claim 23 recites, in part:

“forming a layer of conductive material on a conductive region and a layer of insulation material;

“etching the layer of conductive material to form a trace, the trace having a length, a width, a height, a top surface, and a bottom surface;

“etching the trace to form a slot opening in the top surface of the trace, the slot opening having a bottom surface spaced apart from the bottom surface of the trace, and side walls that extend along the length of the trace.”

As noted above, the Yang reference fails to teach or suggest the “etching the trace to form a slot opening” element. As a result, claim 23 is not anticipated by the Yang reference. In addition, since claims 24-28 depend either directly or indirectly from claim 23, claims 24-28 are not anticipated by the Yang reference for the same reasons as claim 23.

With respect to the Knight reference, claim 23 requires that the trace have a length, and the slot opening have side walls that extend along the length of the trace. From what applicant can determine, FIG. 6 of the Knight reference does not teach or suggest these limitations. As a result, claim 23 is patentable over the Knight reference. In addition, since claims 24-28 depend either directly or indirectly from claim 23, claims 24-28 are patentable over the Knight reference for the same reasons as claim 23.

New claims 29 recites, in part:

“forming a layer of conductive material on a conductive region and a layer of insulation material;

“etching the layer of conductive material to form a trace, the trace having a bottom surface and a substantially planar top surface;

“etching the trace to form a plurality of slot openings in the top surface of the trace, each slot opening having a bottom surface spaced apart from the bottom surface of the trace, a portion of each slot opening lying directly vertically over the conductive region.”

As noted above, the Yang reference fails to teach or suggest the "etching the trace to form a slot opening" element. As a result, claim 29 is not anticipated by the Yang reference. In addition, since claims 30-35 depend either directly or indirectly from claim 29, claims 30-35 are not anticipated by the Yang reference for the same reasons as claim 30.

With respect to the Knight reference, claim 29 requires that the trace be etched to form a plurality of slot openings, and that a portion of each of the slot openings lie directly vertically over the conductive region. FIG. 6 of Knight, however, shows the formation of only a single opening between the left and right pedestals 24, and does not show that this opening is formed over a conductive region. As a result, claim 29 is patentable over the Knight reference. In addition, since claims 30-35 depend either directly or indirectly from claim 29, claims 30-35 are patentable over the Knight reference for the same reasons as claim 29.

Thus, for the foregoing reasons, it is submitted that all of the claims are in a condition for allowance. Therefore, the Examiner's early re-examination and reconsideration are requested.

Respectfully submitted,

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